



Marked-Up Copy

Hygienic Absorbent Article

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a hygienic absorbent article for absorbing the menstrual blood and, more particularly, to a hygienic absorbent article which can be held in close contact with the wearer's body so as not to go out of position by the motion of the body.

Description of Related Art

Typically, hygienic absorbent articles such as sanitary napkins are constructed to have a main body including: a liquid-impermeable back layer (back sheet); a liquid-permeable surface layer (top sheet); and an absorbent layer (absorbent core) sandwiched between the back layer and the surface layer. In addition, a pressure-sensitive adhesive layer is provided on an outer face (garment-facing face) of the back layer. By adhering the pressure-sensitive adhesive layer to an undergarment, the sanitary napkin can be prevented from going out of position with respect to the undergarment.

In order to improve close contact with the private part of a wearer, some of the sanitary napkins are provided at the center of the absorbing region with a protrusion for coming into close contact with the private part.

Conventional sanitary napkins of this type are disclosed, for example, in Japanese Unexamined Utility Model Publication No. 33721/1993 and Japanese Unexamined Patent Publication No. 504486/1998. In both of these disclosures, a protrusion having an absorption power is fixed on the center of the liquid-receiving face of the sanitary napkin. By bringing the protrusion into close contact with the wearer's private part, the ability to trap the menstrual blood is enhanced.

In these sanitary napkins of the prior art, however, the protrusion is fixed without any degree of freedom. Therefore, ~~when~~ the outer face of the back layer is adhered to the inner face

of the undergarment through the pressure-sensitive adhesive layer, but if the undergarment goes out of position from the private part to cause dislocation of the sanitary napkin, the protrusion easily leaves the private part.

Especially when If an undergarment having a weak fastening force to the wearer's body is worn and ~~when~~ the sanitary napkin is fixed on the undergarment by the pressure-sensitive adhesive layer, the protrusion may easily ~~leaves~~ detach from the crotch of a wearer together with the undergarment while the wearer is walking or in bed., ~~thereby to~~ This deteriorates the close contact between the protrusion and the private part.

Moreover, the protrusion provided in the sanitary napkin of the prior art mainly ~~comprises~~includes a hydrophilic fibrous layer. In a wet condition, therefore, it is difficult for the protrusion to elastically restore to its original shape. That is, when the protrusion having absorbed a liquid is pressed against the wearer's body, it easily shrinks. As a result, the protrusion cannot exhibit sufficient elastic restoring force to closely contact with the private part but easily leaves the private part, when the sanitary napkin goes out of position together with the undergarment. In addition, the protrusion thus wetted and pressed against the wearer's body easily becomes stiff, thereby giving an uncomfortable feeling to the wearer.

Moreover, since the sanitary napkin of the prior art is fixed on the undergarment through the pressure-sensitive adhesive layer provided on the back layer, it moves together with the undergarment to cause dislocation from the private part. Therefore, it is required to interpose the absorbent layer and, the back layer over a wide area between the private part and the undergarment. As a result, the entire size of the sanitary napkin ~~becomes~~must be relatively large.

SUMMARY OF THE INVENTION

The present invention has been worked out in view of the foregoing shortcomings of the prior art and has an object to provide a hygienic absorbent article, a A portion that ~~of which to~~ contact ~~with~~ the private part of a wearer is movable with respect to a main body of the article so as to keep close contact with the private part.

portion of each three-dimensional portion, or it may be provided between the connecting portion of the first three-dimensional portion and the connecting portion of the second three-dimensional portion.

In both the first and second aspects of the invention, a pressure-sensitive adhesive layer may be provided on an outer face of the back layer for preventing dislocation of the article during use.

Alternatively, it is possible to fit the ~~skin-contacting~~skin-contactable portion(s) between the labia of a female genital organ when the hygienic absorbent article is worn. In this case, it is preferred that no pressure-sensitive adhesive for preventing dislocation of the article during use is provided on an outer face of the back layer, but the hygienic absorbent article is allowed to be retained on the body of a wearer by closing force of the labia. In order to make the ~~skin-contacting~~skin-contactable portion(s) fit between the labia, preferably, the three-dimensional portion(s) may have a length of 50 to 70 mm in the longitudinal direction of the article and a width of 20 to 40 mm between the free ends thereof in a direction perpendicular to the longitudinal direction. Moreover, it is preferred that the main body has a length of 80 to 120 mm in the longitudinal direction of the article and a width of 40 to 60 mm in a direction perpendicular to the longitudinal direction.

Here, the main body may further ~~comprise~~include a liquid-permeable surface layer covering the absorbent layer, and the three-dimensional portion(s) may be fixed at the fixed ends thereof on the surface layer.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood more fully from the detailed description given hereinafter and from the accompanying drawings of the preferred embodiments of the present invention, which, however, should not be taken to be limitative to the invention, but are for explanation and understanding only.

In the drawings:

Fig. 1 is a perspective view showing a hygienic absorbent article according to a first embodiment of the invention;

Fig. 2 is a sectional view taken along line II - II of Fig. 1;

Fig. 3 is a sectional view taken along line III - III of Fig. 1;

Fig. 4 is a sectional view corresponding to Fig. 2 but shows a modification of the first embodiment;

Fig. 5 is a sectional view corresponding to Fig. 2 but shows a modification of the first embodiment;

Fig. 6 is a perspective view showing a second embodiment of the invention;

Fig. 7 is a sectional view taken along line VII - VII of Fig. 6;

Fig. 8 is a sectional view taken along line VIII - VIII of Fig. 6;

Fig. 9 is a sectional view corresponding to Fig. 7 but shows a modification of the second embodiment;

Fig. 10 is a sectional view corresponding to Fig. 7 but shows a modification of the second embodiment; and

Fig. 11 is a sectional view corresponding to Fig. 7 but shows a hygienic absorbent article according to a third embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention will be discussed hereinafter in detail in terms of the preferred embodiments according to the present invention with reference to the accompanying drawings. In the following description, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be obvious, however, to those skilled in the art that the present invention may be practiced without these specific details. In other

instance, well-known structure are not shown in detail in order to avoid unnecessary obscurity of the present invention.

Fig. 1 is a perspective view showing a hygienic absorbent article 1, as taken from a liquid receiving side, according to a first embodiment of the invention.; Fig. 2 is a sectional view taken along line II - II of Fig. 1.;~~and~~ Fig. 3 is a sectional view taken along line III - III of Fig. 1. Moreover, Figs. 4 and 5 are sectional views corresponding to Fig. 2 but show modifications of the first embodiment.

The hygienic absorbent article 1, as shown in Figs. 1 to 3, has two longitudinally extending side edges 1a and 1b, and a front edge 1c and a rear edge 1d. A liquid-impermeable back layer 2, for confronting an external wear such as an undergarment, ~~is sized equally to the entirety provided as a back portion~~ of the hygienic absorbent article 1. ~~Over the back layer 2, there is laid a~~ An absorbent layer 3 is laid over the back layer 2. This absorbent layer 3 has two longitudinally extending side edges 3a and 3b, and a front edge 3c and a rear edge 3d, but is sized just smaller than the back layer 2. In the hygienic absorbent article 1, the area having the absorbent layer 3 is called a liquid absorbing region 4.

As shown in a transverse section of Fig. 2, side flaps 5 and 5 are respectively formed between the side edges 3 a and the side edge 1a and between the side edges 3b and the side edge 1b, ~~there are formed side flaps 5 and 5, respectively. On the other hand, Rear flaps 6 and 6 are~~ resepctively formed between the front edge 3c and the front edge 1c and between the rear edge 3d and the rear edge 1d, ~~there are formed front and rear flaps 6 and 6, respectively.~~

The hygienic absorbent article 1 is provided on its liquid receiving side with a liquid-permeable sheet 8. A three dimensional portion 10 is formed ~~Over~~ over the liquid absorbing region 4 having the absorbent layer 3, as shown in Fig. 1, ~~there is provided a~~ The three-dimensional portion 10 is formed from the liquid-permeable sheet 8 and extending ~~ing~~ over a region indicated by a longitudinal length L. In the region L, as shown in Fig. 2, the three-dimensional portion 10 is formed from a portion of the liquid-permeable sheet 8 extending between 11a and 11b, ~~wherein~~ t The numeral 11a indicates a first fixed end of the three-dimensional portion 10 which is spaced toward the center of the absorbent layer 3 from the side edge 3a by a predetermined distance, ~~and t~~ The numeral 11b indicates a second fixed end of the three-dimensional portion 10 which is

spaced toward the center of the absorbent layer 3 from the side edge 3b by a predetermined distance.

The first fixed end 11a and the second fixed end 11b are arranged ~~at symmetric~~ positionssymmetrically with respect to a centerline O - O extending longitudinally of the hygienic absorbent article 1. The first fixed end 11a and the second fixed end 11b are formed such that the liquid-permeable sheet 8 and the upper face of the absorbent layer 3 are fixed together (e.g., bonded with a hot-melt adhesive or thermally fused) on a continuous line or an intermittent line parallel to the centerline O - O.

As shown in Fig. 2, the liquid-permeable sheet 8 also provides a surface layer 8a. The layer 8a covers ~~covering~~ the surface of the absorbent layer 3 at its portion extending from the side edge 3a of the absorbent layer 3 to the first fixed end 11a and at its portion extending from the side edge 3b of the absorbent layer 3 to the second fixed end 11b. Moreover, the liquid-permeable sheet 8 has extensions 8b and 8b extending beyond the side edges 3a and 3b of the absorbent layer 3, respectively. Here, the back layer 2 also has extensions 2a and 2a extending beyond the side edges 3a and 3b of the absorbent layer 3, respectively. At the side flaps 5 and 5, the extensions 2a and 2a of the back layer 2 and the extensions 8b and 8b of the liquid-permeable sheet 8 are bonded with a hot-melt type adhesive or the like.

At the front and rear flaps 6 and 6, too, extensions of the back layer 2 ~~extendingextends~~ beyond the front edge 3c and the rear edge 3d of the absorbent layer 3 and extensions of the liquid-permeable sheet 8 ~~extendingextends~~ beyond the front edge 3c and the rear edge 3d of the absorbent layer 3. These extensions are bonded with a hot-melt type adhesive or the like.

The three-dimensional portion 10 thus provided in the region L is ~~of symmetrical~~ shapessymmetrical with respect to the centerline O - O, as shown in the sectional view of Fig. 2. In the three-dimensional portion 10, the liquid-permeable sheet 8 extends upwardly from the first and second fixed ends 11a and 11b to form connecting portions (rising walls) 12a and 12b, respectively. Between the upper ends of the connecting portions 12a and 12b, the liquid-permeable sheet 8 extends symmetrically with respect to the centerline O - O.

the ~~skin-contacting~~skin-contactable portion 12e, through the connecting portions 12a and 12b, and further through the surface layer 8a and can reach the absorbent layer 3. Therefore, the menstrual blood hardly leaks laterally ~~off~~from the hygienic absorbent article 1.

Here, after absorption of the menstrual blood, the absorbent layer 3 becomes stiff. However, since the ~~skin-contacting~~skin-contactable portion 12e of the three-dimensional portion 10 is in close contact with the wearer's private part, the stiffness of the wetted absorbent layer 3 is not directly felt by the private part, thereby preventing deterioration of wearing feel.

Modifications shown in Figs. 4 and 5 are identical in their entire basic structures to that of the hygienic absorbent article 1 shown in Figs. 1 to 3 but are different in their structures of the three-dimensional portion formed in the region L from that of the three-dimensional portion 10 shown in Fig. 2.

In a three-dimensional portion 10A shown in Fig. 4, the connecting portions 12a and 12b rising from the first fixed end 11a and the second fixed end 11b are joined to each other, ~~and a~~
A plurality of elastic members 14 are disposed between the joined connecting portions 12a and 12b, in addition to the elastic members 13 disposed in the ~~skin-contacting~~skin-contactable portion 12e. This hygienic absorbent article is curved by the elastic contractive forces of both the elastic members 13 and the elastic members 14 so that the three-dimensional portion 10A rises in ~~the~~ a T-shaped state in the region L. In the ~~skin-contacting~~skin-contactable portion 12e, ~~moreover,~~ a hydrophilic material layer 15 is disposed between the confronting faces of the folded liquid-permeable sheet 8. This hydrophilic material layer 15 has a liquid absorption power and a liquid holding power and is preferred to have a higher liquid holding power per unit area than that of the liquid-permeable sheet 8. The thickness of the hydrophilic material layer 15 may be arbitrarily selected, as long as it has such liquid holding power and can provide a soft feel to the skin. However, it is preferred that the hydrophilic material layer 15 is thinner or softer than the absorbent layer 3 so as to prevent the ~~skin-contacting~~skin-contactable portion 12e from being stiffened after absorption of the menstrual liquid and to provide a good contact feel to the skin. For example, the hydrophilic material layer 15 is made of tissue paper, air-laid pulp, cotton sheet or the like. Alternatively, a material having an excellent liquid-permeability, such as a sheet

made of synthetic resin fibers treated to be hydrophilic, may be provided in place of the hydrophilic material layer 15.

In the modification shown in Fig. 5, over the back layer 2, there is placed the absorbent layer 3, over which a liquid-permeable sheet 17 is laid. This liquid-permeable sheet 17 provides a surface layer 17a covering the absorbent layer 3 at its portion extending between the two side edges 3a and 3b of the absorbent layer 3. Moreover, the liquid-permeable sheet 17 has extensions 17b and 17b extending outwardly beyond the two side edges 3a and 3b, respectively. At the side flaps 5 and 5, the extensions 2a and 2a of the back layer 2 and the extensions 17b and 17b are fixed with a hot-melt type adhesive or the like. Moreover, a liquid-permeable sheet 18 forming a three-dimensional portion 10B is disposed over the surface layer 17a. The liquid-permeable sheet 18 forming the three-dimensional portion 10B has the connecting portions 12a and 12b, which rise from the first fixed end 11a and the second fixed end 11b fixed to the liquid-permeable sheet 17 forming the surface layer 17a. These connecting portions 12a and 12b are joined together at their upper ends to form a join portion 12f. The skin-contactable portion 12ce is formed ~~Over this join portion 12f, moreover, there is formed the band-shaped, skin-~~ ~~contacting~~ The skin-contactable portion 12e which has the free ends 12c and 12d on the two sides. Here, it is, ~~of course,~~ possible to provide the hydrophilic material layer 15 of Fig. 4 in the ~~skin-contacting~~ skin-contactable portion 12e of Fig. 5, and to provide the elastic members 14 of Fig. 4 between the connecting portions 12a and 12b of Fig. 5.

Although not shown in drawings, moreover, it is also possible to provide a hydrophilic material layer similar to the hydrophilic material layer 15 between the connecting portions 12a and 12b forming the stem of the three-dimensional portions 10, 10A and 10B. With the hydrophilic material layer provided between the connecting portions 12a and 12b, the stem of the three-dimensional portion is allowed to absorb a small amount of menstrual blood. Therefore, the menstrual blood is effectively prevented from leaking laterally of the hygienic absorbent article 1. ~~Here, if the~~ A hydrophilic material layer that is thinner and softer than the absorbent layer 3 can be provided between the connecting portions 12a and 12b, ~~is thinner or softer than the absorbent layer 3, it hardly obstructs~~ Such a hydrophilic material layer does not interfere with the flexures of the connecting portions 12a and 12b so that the abutment of the three-dimensional portion against the skin can be softened.

Fig. 6 is a perspective view showing a hygienic absorbent article 1A according to a second embodiment of the invention. Fig. 7 is a sectional view taken along line VII - VII of Fig. 6. Fig. 8 is a sectional view taken along line VIII - VIII of Fig. 6, and Figs. 9 and 10 are sectional views corresponding to the sectional view of Fig. 7 but show modifications of the second embodiment. Here, the detailed description of the portions having the same constructions as those of the first embodiment will be omitted. The common members will be designated by designating them by the common reference numerals.

In the second embodiment shown in Figs. 6, 7 and 8, the absorbent layer 3 is laid over the back layer 2 having the same size as that shown in Fig. 1. Moreover, symmetrically with respect to the longitudinal centerline O - O, a first liquid-permeable sheet 21 extends from one side edge 1a of the hygienic absorbent article 1A to the vicinity of the centerline O - O, and a second liquid-permeable sheet 22 extends from the other side edge 1b to the vicinity of the centerline O - O.

The first liquid-permeable sheet 21 and the second liquid-permeable sheet 22 are folded in two and are fixed to the surface of the absorbent layer 3 at a first fixed end 31a and at a second fixed end 31b in the vicinity of the centerline O - O. The first and second fixed ends 31a and 31b are formed such that each of the liquid-permeable sheets 21 and 22 and the absorbent layer 3 are fixed together (e.g., bonded with a hot-melt adhesive or thermally fused) on a continuous line or an intermittent line parallel to the centerline O - O.

The first liquid-permeable sheet 21 thus folded in two provides: (a) a surface layer 21a at its portion covering the absorbent layer 3 from the side edge 3a of the absorbent layer 3 to the first fixed end 31a; and (b) an extension 21b at its portion extending outward beyond the side edge 3a of the absorbent layer 3. The extension 2a of the back layer 2, extending outward beyond the side edge 3a, and the extension 21b are bonded with a hot-melt type adhesive or the like to form ~~one~~ a side flap 5. Similarly, the second liquid-permeable sheet 22 thus folded in two provides: (a) a surface layer 22a at its portion covering the absorbent layer 3 from the side edge 3b of the absorbent layer 3 to the second fixed end 31b; and (b) an extension 22b at its portion extending outward beyond the side edge 3b of the absorbent layer 3. The extension 2a of the back layer 2, extending outward beyond the side edge 3b, and the extension 22b are bonded with

a hot-melt type adhesive or the like to form the other side flap 5. At the front and rear flaps 6 and 6 shown in Fig. 6, ~~moreover,~~ the first liquid-permeable sheet 21 and the second liquid-permeable sheet 22 are bonded to the back layer 2.

~~Moreover,~~ ~~t~~ The first liquid-permeable sheet 21 provides a first three-dimensional portion 30A at a portion rising from the first fixed end 31a; ~~and t~~ ~~t~~ The second liquid-permeable sheet 22 provides a second three-dimensional portion 30B at a portion rising from the second fixed end 31b. These first three-dimensional portion 30A and second three-dimensional portion 30B are made symmetric with respect to the centerline 0 - 0 to have connecting portions (rising walls) 32a and 32b rising from the first fixed end 31a and the second fixed end 31b, respectively, and ~~skin-contacting~~ skin-contactable portions 34a and 34b bent to the left and right from the upper ends of the connecting portions 32a and 32b, respectively. The connecting portions 32a and 32b are bonded to each other. The ~~skin-contacting~~ skin-contactable portion 34a has a free end 33a located closer to the side edge 3a than the first fixed end 31a; ~~and t~~ ~~t~~ The ~~skin-contacting~~ skin-contactable portion 34b has a free end 33b located closer to the side edge 3b than the second fixed end 31b.

As shown in Fig. 6, the first and second three-dimensional portions 30A and 30B have front and rear ends 30c and 30d. At the front and rear end portions (as located outside of the front and rear ends 30c and 30d) of the hygienic absorbent article 1A, as shown in Fig. 8, the first liquid-permeable sheet 21 and the second liquid-permeable sheet 22 provide flat, folded portions 21c and 22c, respectively. These folded portions 21c and 22c are folded back in opposite directions with respect to the centerline O - O, and are fixed as a whole onto the absorbent layer 3 or the back layer 2 with an adhesive.

The first liquid-permeable sheet 21 and the second liquid-permeable sheet 22 are provided with a plurality of elastic members 35 extending longitudinally of the article 1A. Therefore, the front ends 30c and the rear ends 30d of the first three-dimensional portion 30A and the second three-dimensional portion 30B are pulled to each other by the elastic contractive force of the elastic members 35 to curve the hygienic absorbent article 1A. As a result, the first three-dimensional portion 30A and the second three-dimensional portion 30B are raised into a T-shaped state away from the surface layers 21a and 22a.

with elastic members 36 extending longitudinally of the article 1A. As shown in Fig. 9, the first fixed end 31a and the second fixed end 31b are formed at symmetric positions with respect to the centerline O - O while being spaced by a distance W2.

Fig. 10 shows another modification of the second embodiment. In the modification shown in Fig. 10, the liquid-permeable sheet 23 is laid on the absorbent layer 3 to form ~~the a~~ surface layer 23a covering the absorbent layer 3, as in the modification shown in Fig. 9. Over this surface layer 23a, a first three-dimensional portion 30E is formed from ~~the a~~ first liquid-permeable sheet 21, and a second three-dimensional portion 30F is formed from ~~the a~~ second liquid-permeable sheet 22. The three-dimensional portions 30E and 30F have ~~the connecting~~ portions 32a and 32b and the ~~skin-contacting~~skin-contactable portions 34a and 34b, respectively. In the three-dimensional portions 30E and 30F, the ~~skin-contacting~~skin-contactable portions 34a and 34b are provided with the longitudinally extending elastic members 36, and in addition, the connecting portions 32a and 32b are provided with elastic members 37. In the modification shown in Fig. 10, at the front and rear end portions of the hygienic absorbent article, the first liquid-permeable sheet 21 and the second liquid-permeable sheet 22 are individually folded by crushing Σ shape vertically into a flat state. The individual sheets 21 and 22 thus folded are fixed all over their faces to the surface of the liquid-permeable sheet 23. Thus, the first three-dimensional portion 30E and the second three-dimensional portion 30F can rise to have a Σ -shaped section symmetrically with respect to the centerline O - O when the hygienic absorbent article 1A is curved by the elastic contractive forces of the elastic members 36 and 37.

In the modifications shown in Figs. 9 and 10, when the hygienic absorbent article is worn by fixing the pressure-sensitive adhesive layer of the back layer 2 on an undergarment, the individual ~~skin-contacting~~skin-contactable portions 34a and 34b contact closely with the wearer's private part so that the close contact between the ~~skin-contacting~~skin-contactable portions 34a and 34b and the private part can be kept even when the back layer 2 moves together with the undergarment. Moreover, since the ~~skin-contacting~~skin-contactable portions 34a and 34b of the separate three-dimensional portions can exhibit the independent behaviors, the ~~skin-contacting~~skin-contactable portions 34a and 34b can contact closely with the private part independently of each other. Even if the back layer 2 moves laterally or away from the private

hygienic absorbent article is curved by the elastic contractive force of the elastic members 46, so that the first and second three-dimensional portions 30G and 30H are raised to bring their free ends 45a and 45b away from the liquid-permeable sheet 23.

In this third embodiment, too, the ~~skin-contacting~~skin-contactable portions 44a and 44b of the first and second three-dimensional portions 30G and 30H can behave independently of each other to contact closely with the wearer's private part in an elastic manner.

In the foregoing individual embodiments and the modifications thereof, a width W3 (although omitted from Figs. 4 and 5) between the free ends of the ~~skin-contacting~~skin-contactable portion (s) is set within a range of 10 to 60 mm, preferably within a range of 20 to 50 mm, or more preferably within a range of 30 to 50 mm. Moreover, it is preferable that the width W3 is within a range of 20 to 70 % of a width W1 (although omitted from Figs. 4, 5, 7 and 11) between the side edge 3a and the side edge 3b of the absorbent layer 3. With the width between the free ends of the ~~skin-contacting~~skin-contactable portion(s) being set within the specified ranges, the ~~skin-contacting~~skin-contactable portion of the three-dimensional portion can easily contact closely with the private part of a wearer. In addition, a distance W2 (although only shown in Figs. 9 and 10) between the fixed ends, where the two connecting portions of the three-dimensional portion(s) start to rise, is preferably 0 to 40 mm, more preferably 0 to 30 mm or most preferably 0 to 20 mm. It is also preferable that the ratio of W2/W1 (i.e., the ratio of the distance W2 between the fixed ends to the width W1 of the absorbent layer 3) is no more than 1/2. With this range, the width W3 between the free ends of the ~~skin-contacting~~skin-contactable portion(s) can be set within the above-specified preferable range.

On the other hand, a length of the three-dimensional portions, which is indicated at L in Fig. 1 and at L1 in Fig. 6, is preferably within a range of 150 to 400 mm, more preferably within a range of 200 to 360 mm. By setting the length L or L1 within the specified ranges to be sufficiently long in the longitudinal direction of the article, the ~~skin-contacting~~skin-contactable portion can contact closely with not only the vicinities of the labia of the private part but also the clearance between the buttocks, so that the menstrual blood can be suppressed from leaking toward the buttocks while the wearer is in bed.

~~skin-contacting~~skin-contactable portions to behave independently of each other, as shown in Figs. 9, 10 and 11, the ~~skin-contacting~~skin-contactable portions can be easily retained between the labia.

In the embodiments and modifications shown in Figs. 7, 9, 10 and 11, ~~too, there may be adopted~~ a structure in which a hydrophilic material layer similar to the hydrophilic material layer 15 of Fig. 4 ~~is may be adopted provided~~ in the ~~skin-contacting~~skin-contactable portion of each three-dimensional portion. With the hydrophilic material layer being provided in the ~~skin-contacting~~skin-contactable portion, this ~~skin-contacting~~skin-contactable portion can be thickened to have a certain degree of stiffness. Therefore, when retained between the labia, the paired ~~skin-contacting~~skin-contactable portions do not easily come off the labia. Moreover, such a thin, hydrophilic material layer similar to the hydrophilic material layer 15 of Fig. 4 may be provided between the connecting portions 32a and 32b of Fig. 7. It may also be provided in each of the connecting portions 32a and 32b of Figs. 7, 9, and 10 or in each of the connecting portions 43a and 43b of Fig 11 (i.e., between the confronting faces of the folded sheet at the connecting portions 32a and 32b or 43a and 43b) .

In the case where the hygienic absorbent article is thus designed to be held on the wearer's body by fitting the three-dimensional portion(s) between the labia, its entire size (i.e., the size of the main body) can be made smaller than that of the type to be fixed on an undergarment. Even if the entire size is made smaller, dislocation hardly occurs between the female genital organ and the absorbent layer 3 ~~due to~~because of the fitting of the three-dimensional portion (s) between the labia. Therefore, lateral leakage of the menstrual blood can be effectively prevented. Moreover, it is unnecessary to make the back layer 2 sufficiently larger than the absorbent layer 3, but it is possible to ~~give a substantially equal size to~~make the back layer 2 ~~and~~substantially equal in size with the absorbent layer 3. Alternatively, the left and right side flaps 5 and 5 and the front and rear flaps 6 and 6 can be made ~~as narrow as~~ to have a width of 5 mm or less or 3 mm or less, so that the size of the hygienic absorbent article can be reduced ~~in its entire size~~.

In order that the ~~skin-contacting~~skin-contactable portion(s) may be easily retained between the labia, it is preferable that the width W3 between the free ends of the ~~skin-~~

The liquid-permeable sheet 17 for forming the surface layer 17a shown in Fig. 5 or the liquid-permeable sheet 23 for forming the surface layer 23a shown in Figs. 9 to 11 may be formed from an absorbent material having a wet strength such as air-laid pulp, an apertured plastic film as a liquid-permeable material, a nonwoven fabric composed of hydrophobic synthetic fibers which are treated to be hydrophilic, or an apertured nonwoven fabric.

On the other hand, the liquid-permeable sheet (or the liquid-permeable material) for forming the three-dimensional portions 10, 10A, 10B, 30A and 30B, 30C and 30D, 30E and 30F, and 30G and 30H of the foregoing individual embodiments may be a through air nonwoven fabric having a high bulk and a low liquid residue, or an apertured plastic film having a high liquid shielding effect. For example, the through air nonwoven fabric is made of bicomponent fibers having sheath/core structure, and is preferred to have a basis weight within a range of 20 to 40 g/m² and a thickness within a range of 0.3 to 1.5 mm. On the other hand, the apertured plastic film is preferably made of an olefin resin having a density within a range of 0.90 x 10⁶ to 0.93 x 10⁶ g/cm³ to have a basis weight within a range of 20 to 35 g/m². At this time, the surface of the apertured plastic film is preferred to have an open area ratio within a range of 30 to 70 %. Here, each aperture may be of a round, rhomboid or polygonal shape but should not be limited thereto. Moreover, the area of each aperture or the arrangement pattern of the apertures should not be especially limited. Alternatively, the liquid-permeable sheet (or the liquid-permeable material) for forming the three-dimensional portions may be a point-bonded nonwoven fabric, a spun-laced nonwoven fabric or an air-laid nonwoven fabric. These nonwoven fabrics may contain regenerated cellulose fibers (such as viscose rayon or acetate rayon) or natural cellulose fibers, in addition to the aforementioned bicomponent fibers. A spun-bonded or melt-blown nonwoven fabric may also be employed. The apertured plastic film or the nonwoven fabric may be employed alone or laid on another apertured plastic film or nonwoven fabric having the same structure. Of course, it is possible to laminate different kinds of apertured plastic film or nonwoven fabric.

In the foregoing embodiments and their modifications, each three-dimensional portion is formed from a single liquid-permeable sheet. However, the connecting portion of each three-dimensional portion may be made of a hydrophobic or water-repellent material to be liquid-impermeable, as long as the upper face of the skin-contacting skin-contactable portion of each

three-dimensional portion is made of a liquid-permeable material. In this case, the menstrual blood given to the ~~skin-contacting~~skin-contactable portion closely contacting with the private part of a wearer is guided along the liquid-impermeable connecting portion into the absorbent layer.

Although the present invention has been illustrated and described with respect to exemplary embodiments thereof, it should be understood by those skilled in the art that the foregoing and various other changes, omission and additions may be made therein and thereto, without departing from the spirit and scope of the present invention. Therefore, the present invention should not be understood as limited to the specific embodiments set out above but to include all possible embodiments which can be embodied within a scope encompassed and equivalent thereof with respect to the feature set out in the appended claims.

ABSTRACT OF THE DISCLOSURE

Disclosed is a hygienic absorbent article including: a back layer; an absorbent layer; and a three-dimensional portion. The three dimensional portion ~~to~~ rises in a T-shaped state over the absorbent layer ~~due to~~ because of the longitudinal elastic contractive force of elastic members ~~provided~~ disposed within in the three-dimensional portion. The three-dimensional portion has: connecting portions fixed onto the absorbent layer; and a ~~skin-contacting~~ skin-contactable portion connected to the absorbent layer through the connecting portions and having a pair of free ends.